

## WHAT IS CLAIMED IS:

1. (Amended) A coated molding, comprising:

a molding mainly composed of a thermoplastic resin; and  
a coating film coated on at least a surface of said molding,  
characterized in that

a resin constituting said coating film and said resin  
constituting said molding have affinity for each other at least  
at interfaces therebetween or in a boundary region, and said resin  
constituting said coating film comprises a thermoplastic resin  
capable of repeatedly molding by heating and melting after mixing  
with said thermoplastic resin used as a main constituent of said  
molding.

2. (Amended) A coated molding according to Claim 1,  
characterized in that

said thermoplastic resin constituting said coating film is  
dispersed in the main constituent of said molding and said  
thermoplastic resin constituting said coating film has the same  
nature as or a nature different from said thermoplastic resin used  
as the main constituent of said molding and both thermoplastic  
resins mutually exhibit a nature of heat fusion, heat adhesion,  
heat stickiness, heat bonding, heat attachment, heat adherence,  
heat affinity, heat wetness or heat melting.

3. A coated molding according to Claim 1,

characterized in that

said thermoplastic resin constituting said coating film has the same nature as or a nature different from said thermoplastic resin used as the main constituent of said molding and exhibits compatibility or miscibility with said thermoplastic resin used as the main constituent of said molding.

4. (Amended) A coated molding according to Claim 1, characterized in that

said thermoplastic resin constituting said coating film has the same nature as or a nature different from said thermoplastic resin used as the main constituent of said molding, and is dispersed in said thermoplastic resin used as the main constituent of said molding so as to be able to be stabilized as having a sea-island structure.

5. A coated molding according to Claim 1, characterized in that

said thermoplastic resin constituting said coating film has the same nature as or a nature different from said thermoplastic resin used as the main constituent of said molding and is capable of being mixed at a molecular level with said thermoplastic resin used as the main constituent of said molding.

6. A coated molding according to Claim 3, characterized in that

said thermoplastic resin used as the main constituent of said

molding and said thermoplastic resin constituting said coating film comprise the same resin, resins having the same skeleton or the same branch, or different resins having similar properties.

7. A coated molding according to Claim 3,  
characterized in that

said thermoplastic resin used as the main constituent of  
said molding comprises at least one selected from styrene resins,  
vinyl resins, amino resins, olefin resins, allied resins and  
similar resins, and

said thermoplastic resin used as a main constituent of said  
coating film comprises at least one selected from acrylic resins,  
styrene resins, vinyl resins, amino resins, olefin resins, allied  
resins and similar resins.

8. A coated molding according to Claim 3,  
characterized in that

said thermoplastic resin used as the main constituent of said  
molding comprises an ABS resin, and

said thermoplastic resin used as a main constituent of said  
coating film comprises an acrylonitrile-styrene copolymer resin,  
a styrene-modified acrylic resin or a thermoplastic acrylic resin.

9. A coated molding according to Claim 3,  
characterized in that

said thermoplastic resin used as the main constituent of said  
molding comprises a high impact polystyrene resin, and

said thermoplastic resin used as a main constituent of said  
coating film comprises a polystyrene resin or a styrene-modified  
acrylic resin.

10. A coated molding according to Claim 3,  
characterized in that

said thermoplastic resin used as the main constituent of  
said molding comprises a modified polyphenylene oxide (ether) resin,  
and

said thermoplastic resin constituting said coating film  
comprises polystyrene resin or a styrene-modified acrylic resin.

11. A coated molding according to Claim 3,  
characterized in that

said thermoplastic resin used as the main constituent of said  
molding is made of polypropylene resin or polyethylene resin, and

said thermoplastic resin constituting said coating film  
comprises a chlorinated polypropylene resin or a halogenated  
polyolefin resin.

12. A coated molding according to Claim 4,  
characterized in that

said thermoplastic resin constituting said coating film is  
dispersed in the form of islands in said thermoplastic resin used  
as the main constituent of said molding has a sea-island structure  
or other structure, and

said thermoplastic resin constituting said coating film  
dispersed in the form of islands has an aspect ratio of from 0.2  
to 1.

13. (Amended) A coated molding,

characterized in that

a molding, coated on a surface thereof with a paint composed of a thermoplastic resin capable of repeatedly molding by heating and melting after mixing with a thermoplastic resin used as a constituent of a molding, is molded by heating and melting,

said thermoplastic resin as the main constituent of the paint is dispersed in the form of island within said thermoplastic resin as the constituent of the molding, and

said paint, mainly composed of a thermoplastic resin capable of repeatedly molding by heating and melting after mixing with the thermoplastic resin as the constituent of the molding, is painted on the molding molded by heating and melting.

14. (Amended) A coated molding according to claim 13, characterized in that

an aspect ratio of the thermoplastic resin as the main constituent of the paint dispersed in the form of islands is from 0.1 to 1.

15. (Amended) A coated molding, characterized by comprising: a molding mainly composed of a thermoplastic resin; and a coating film directly attached on a surface of said molding, characterized in that

a resin constituting said coating film and said resin constituting said molding have affinity for each other at least at interfaces therebetween or in a boundary region, and

said coating film comprises a thermoplastic resin capable of repeatedly molding by heating and melting after mixing with said thermoplastic resin used as a main constituent of said molding, and

said coating film is directly coated to an entire outer surface of said molding, or

said coating film is directly coated to a part of an outer or inner surface of said molding.

~~16.~~ (Amended) A method for manufacturing coated moldings, characterized by comprising the steps of;  
molding molded articles from a thermoplastic resin, and  
coating a paint on a surface of said molded articles wherein said paint comprises as a main constituent thereof a thermoplastic resin capable of repeatedly molding by heating and melting after mixing with said thermoplastic resin used as a main constituent of said molded articles.

~~17.~~ (Amended) A method for recycling coated moldings, characterized by comprising the steps of:  
crushing coated moldings, each including a molding coated with a paint constituted of a thermoplastic resin which is capable of repeatedly molding by heating and melting after mixing with a thermoplastic resin constituting said molding and which has the same nature as or a nature different from the thermoplastic resin constituting said molding;

18. A method for recycling coated moldings according to

Claim 17,

characterized by comprising the steps of;

providing crushed moldings as they are, or mixing and melting the crushed moldings to extrude the melted mixture in the form of pellets; and

re-molding a molded articles from the crushed moldings or said pellets.



19. A method for recycling coated moldings according to Claim

18,

characterized in that

crushed pieces or pellets of plural types of coated moldings, which are constituted of a thermoplastic resin used as a main constituent of moldings and a thermoplastic resin constituting a paint coated on the moldings, said thermoplastic resin for the paint having affinity for the first-mentioned thermoplastic resin at least at interfaces or in a boundary region established on extrusion and capable of repeatedly molding after mixing with said first-mentioned thermoplastic resin, and which are mixed at a given ratio and subjected to re-molding.

20. A method for recycling coated moldings according to Claim

19,

Characterized in that

at least one of said coated moldings is a foamed product, and said at least one and the other of coated moldings are melt mixed in such a state as to exert a given back pressure thereon so that a generated gas is dissolved under pressure in a resin melt.

21. A method for recycling coated moldings according to Claim

20,

characterized in that

a hermetically sealed mold whose mating faces are sealed is pressurized to a level higher than an atmospheric pressure, and

a resin melt is injected into the sealed mold through a switching mechanism.

22. A method for recycling coated moldings according to Claim 18,

characterized by comprising the steps of ;

crushing, melt mixing and extruding into pellets first coated moldings each including an ABS resin molding coated with a paint based on a varnish comprising a styrene-modified acrylic resin; and

crushing, melt mixing and extruding into pellets second coated moldings each including a PC resin molding coated with a paint based on a varnish comprising a styrene-modified acrylic resin.

23. A method for recycling coated moldings according to Claim 18,

characterized in that

when the pellets of plurality of moldings are mixed at a given ratio and molded, a compatibilizing agent is added at a given ratio by weight to said mixed pellets.

24. A method for recycling coated moldings according to Claim 22,

characterized in that

when the pellets of the first and second coated moldings are mixed at the given ratio and molded, said compatibilizing agent is

added to at a ratio by weight of 1 to 15%.

25. A method for recycling coated moldings according to Claim 19,

characterized by comprising the steps of ;

crushing, melt mixing and extruding into pellets first coated moldings each including an ABS resin molding coated with a paint based on a varnish comprising a styrene-modified acrylic resin; and

crushing, melt mixing and extruding into pellets second moldings of a PET resin.

26. A method for recycling coated moldings according to Claim 23,

characterized in that

the pellets of the first and second moldings mixed at the given ratio are heated to a predetermined temperature for a given time, and

molding the thus heated mixed pellets.

27. A method for recycling coated moldings according to Claim 26,

characterized in that

moldings obtained by molding the heated mixed pellets are coated with paint based on a varnish comprising a styrene-modified acrylic resin.

28. A method for recycling coated moldings according to Claim

19,

characterized by comprising the steps of  
crushing first coated moldings each including an ABS resin  
molding coated with a paint based on a varnish comprising a  
styrene-modified acrylic resin,

melt mixing and extruding into pellets; and

crushing second coated moldings made of a PMMA resin, melt  
mixing and extruding into pellets.

29. A method for recycling coated moldings according to Claim

28,

characterized in that

both pellets are mixed and molded to obtain moldings, and  
said moldings are coated with a first paint based on a varnish  
comprising an acrylic acid nitrile-styrene copolymer resin.

30. A method for recycling coated moldings according to Claim

19,

characterized by comprising the steps of

crushing first coated moldings made of a HIPS resin, melt  
mixing and extruding into pellets;

crushing second coated moldings made of a foamed PS resin  
material, melt mixing and extruding into pellets; and

mixing the pellets of the first and second moldings and  
molding the mixed pellets.

31. A method for recycling coated moldings according to Claim

30,

characterized in that

the resultant moldings are coated with a second paint based on a polystyrene resin varnish.

32. A method for recycling coated moldings according to Claim

17,

characterized in that

the pellets obtained by melt mixing the crushed moldings and extruding are mixed with a given amount of a virgin resin or a component of said virgin resin, serving as a recycle aid, for said coated moldings, and the mixture is molded in order to obtain moldings.

33. A method for recycling coated moldings according to Claim

32,

characterized in that

a given amount of at least one addition agent selected from reinforcing materials, fillers and other kinds of addition agents are added to the recycle aid, and the mixture is molded in order to obtain moldings.

34. A method for recycling coated moldings according to Claim

17,

characterized in that

a refused toner is added to crushed pieces or pellets of moldings of a thermoplastic resin exhibiting at least affinity for

a thermoplastic resin constituting said refused toner at a given ratio.

35. A paint for resin moldings,  
characterized in that

said paint comprises a thermoplastic resin which has the same nature as or a nature different from a thermoplastic resin of coated resin moldings and is capable of repeatedly molding after mixing with the thermoplastic resin of the coated resin moldings.

36. A paint for resin moldings according to Claim 35,  
characterized in that

said thermoplastic resin used as a main constituent of said paint comprises the same resin, resin having the same skeleton or branch as the thermoplastic resin, or different types of resins having similar properties.

37. A paint for resin moldings according to Claim 35,  
characterized in that

said thermoplastic resin used as a main constituent of said paint comprises a resin selected from acrylic acid nitrile-styrene copolymer resin, polystyrene resin, styrene-modified acrylic resins, thermoplastic acrylic resins and halogenated polyolefins.

38. A paint for resin moldings according to Claim 35,  
characterized in that

said thermoplastic resin constituting said paint comprises a single kind of thermoplastic resin.

39. A paint for resin moldings according to Claim 35,  
characterized in that

said thermoplastic resin constituting said paint is made of  
at least two kinds of thermoplastic resins.

40. A paint for resin moldings according to Claim 36,  
characterized in that

said thermoplastic resin constituting said paint comprises  
a styrene-modified acrylic resin having a weight average molecular  
weight ranging from 10,000 to 60,000.

41. A paint for resin moldings according to Claim 40,  
characterized in that

said paint comprises a solvent which has a boiling point  
determined in response to a molecular weight of said thermoplastic  
resin mainly constituting said paint.

42. A paint for resin moldings according to Claim 35,  
characterized by comprising

a thermoplastic resin, which has the same nature as or a  
different nature from a thermoplastic resin used as a constituent  
of coated resin moldings and is capable of repeatedly molding after  
mixing with the second-mentioned thermoplastic resin, a solvent,  
and a given amount of a refused toner serving as a pigment.

~~43.~~ A method for preparing a paint for resin moldings,  
characterized by

providing a thermoplastic resin which is used as a main

constituent of a paint for resin moldings and which has the same nature as or different nature from a thermoplastic resin for resin moldings to be coated and is capable of repeatedly molding after mixing with the thermoplastic resin, and preparing a paint with or without addition of any solvent or water and, if necessary, with addition of a pigment or a dye, or a surface conditioner or other addition agents by dispersing or melting.

44. A method for preparing a paint for resin moldings according to Claim 43,

characterized by

adding a solvent having a boiling point, which is determined in response to a molecular weight of the thermoplastic resin, used as the main constituent of the paint.

45. A method for preparing a paint for resin moldings according to Claim 44,

characterized by

adding a mixed solvent as the solvent to said thermoplastic resin.

46. A method for preparing a paint for resin moldings according to Claim 45,

characterized by the steps of:

charging an acrylonitrile-styrene resin in a mixed solvent of toluene and butyl acetate while agitating so as to make a given solid content and continuing agitation for a given time until the



resin is dissolved in the mixed solvent to obtain a varnish;

mixing butyl acetate, titanium oxide, calcium carbonate, talc iron oxide yellow and carbon black under agitation for a given time to provide a mill base and dispersing the mill base in the varnish until a given particle size is attained; and

further adding toluene, butyl acetate, cyclohexanone and a surface conditioner to the resultant dispersion to obtain a first paint.

47. A method for preparing a paint for resin moldings according to Claim 45,

characterized by comprising the steps of:

charging polystyrene resin in a mixed solvent of toluene and butyl acetate while agitating so as to make a given solid content and continuing agitation for a given time until the resin is dissolved in the mixed solvent to obtain a varnish;

mixing butyl acetate, titanium oxide, calcium carbonate, talc iron oxide yellow and carbon black under agitation for a given time to provide a mill base and dispersing the mill base in the varnish until a given particle size is attained; and

further adding toluene, butyl acetate, cyclohexanone and a surface conditioner to the resultant dispersion to obtain a second paint.

48. A method for preparing a paint for resin moldings according to Claim 45,

characterized by comprising the steps of:

preparing a styrene-modified acrylic resin varnish;

mixing butyl acetate, toluene, titanium oxide, calcium carbonate, talc iron oxide yellow and carbon black under agitation for a given time to provide a mill base and dispersing the mill base in the varnish until a given particle size is attained; and

further adding toluene, butyl acetate, and a surface conditioner to the resultant dispersion to obtain a third paint.

49. An apparatus for recycling coated moldings, characterized by comprising:

a crusher for crushing coated moldings which are coated with a paint constituted of a thermoplastic resin having the same nature as or different nature from a thermoplastic resin used to constitute the moldings and capable of repeatedly molding after mixing with the second-mentioned thermoplastic resin;

a molding device for molding crushed or pelletized coated moldings into fresh moldings; and

coating device for coating a paint constituted of a thermoplastic resin having the same nature as or different nature from the thermoplastic resin used to constitute the moldings and capable of repeatedly molding after mixing with the thermoplastic resin of the moldings, on surfaces of the molded moldings.

50. An apparatus for recycling coated moldings according to Claim 49,

Characterized by further comprising

a pellet extrusion device wherein the crushed moldings are melt after mixing and pelletized to provide pellets which are then charged into said molding device.

51. An apparatus for recycling coated moldings according to Claim 50,

Characterized in that

said pellet extruding device is a single-screw extruder wherein the crushed moldings are melt mixed and extruded at a low speed at small revolutions of the screw.

~~52.~~ A method for evaluating recyclability of reproduced coated moldings,

characterized by comprising:

providing molding of test piece obtained by crushing and molding coated moldings which include moldings and a film formed on surfaces of the moldings by coating a paint constituted mainly of a thermoplastic resin having the same nature as or different nature from a thermoplastic resin used as a main constituent of the moldings and capable of repeatedly molding after mixing with the thermoplastic resin for said last-mentioned moldings;

coating the said molded test piece with a paint, which is constituted mainly of a thermoplastic resin having the same nature as or different nature from a thermoplastic resin used as a main constituent of said molded test piece and capable of repeatedly

characterized in that

recycling of reproduced-coated moldings is repeated, and a test for film properties is conducted in every repetition to evaluate recyclability of reproduced-coated moldings in every repetition from the transition in the results of the test.

56. A method for evaluating recyclability of reproduced coated molding according to Claim 55, characterized in that

recycling of reproduced coated moldings is repeated, and mechanical strength, thermal properties and other physical properties are measured in every repetition to evaluate recyclability of reproduced coated moldings in every repetition from the transition in the results of the measured physical properties.

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*Sub A'* 57. (Added) A coated molding according to Claim 13, characterized in that an aspect ratio of the thermoplastic resin as the main constituent of the paint dispersed in the form of islands is from 0.2 to 1.

58. (Added) A method for recycling coated moldings, characterized in that a molding, coated on a surface thereof with a paint composed of a thermoplastic resin having the same nature as or a nature different from said thermoplastic resin as the constituent of said

molding or a capable of repeatedly molding by heating and melting after mixing with said thermoplastic resin as the constituent of said molding, is crushed or pelletized, and

said crushed or pelletized molding is molded by heating and melting,

so that said thermoplastic resin as the constituent of said paint is dispersed in said thermoplastic resin as the constituent of said molding.

molding after mixing with the thermoplastic resin for said molded test piece to provide the reproduced and coated test piece; and  
subjecting said coated test piece or a cross hatch test to evaluate recyclability of the reproduced coated test piece based on the results of the test.

53. A method for evaluating recyclability of reproduced coated moldings,  
characterized by  
providing a mixed resin of a thermoplastic resin constituting moldings and a thermoplastic resin constituting a paint at a given ratio,  
molding the mixed resin into a test piece of molding, and  
subjecting the molded test piece to a cross hatch test to evaluate recyclability of reproduced-coated moldings based on the results of the test.

54. A method for evaluating recyclability of reproduced coated moldings according to Claim 53,  
characterized in that  
a state of dispersion of the thermoplastic resin used as a main constituent of said paint in a thermoplastic resin matrix used as a main constituent of the test piece which is a reproduced coated molding is evaluated by observation through a microphotograph.

55. A method for evaluating recyclability of reproduced coated moldings according to Claim 54,

characterized in that

recycling of reproduced-coated moldings is repeated, and a test for film properties is conducted in every repetition to evaluate recyclability of reproduced-coated moldings in every repetition from the transition in the results of the test.

56. A method for evaluating recyclability of reproduced coated molding according to Claim 55,

characterized in that

recycling of reproduced coated moldings is repeated, and mechanical strength, thermal properties and other physical properties are measured in every repetition to evaluate recyclability of reproduced coated moldings in every repetition from the transition in the results of the measured physical properties.